

# **Radiation Protection Services in R.Macedonia**

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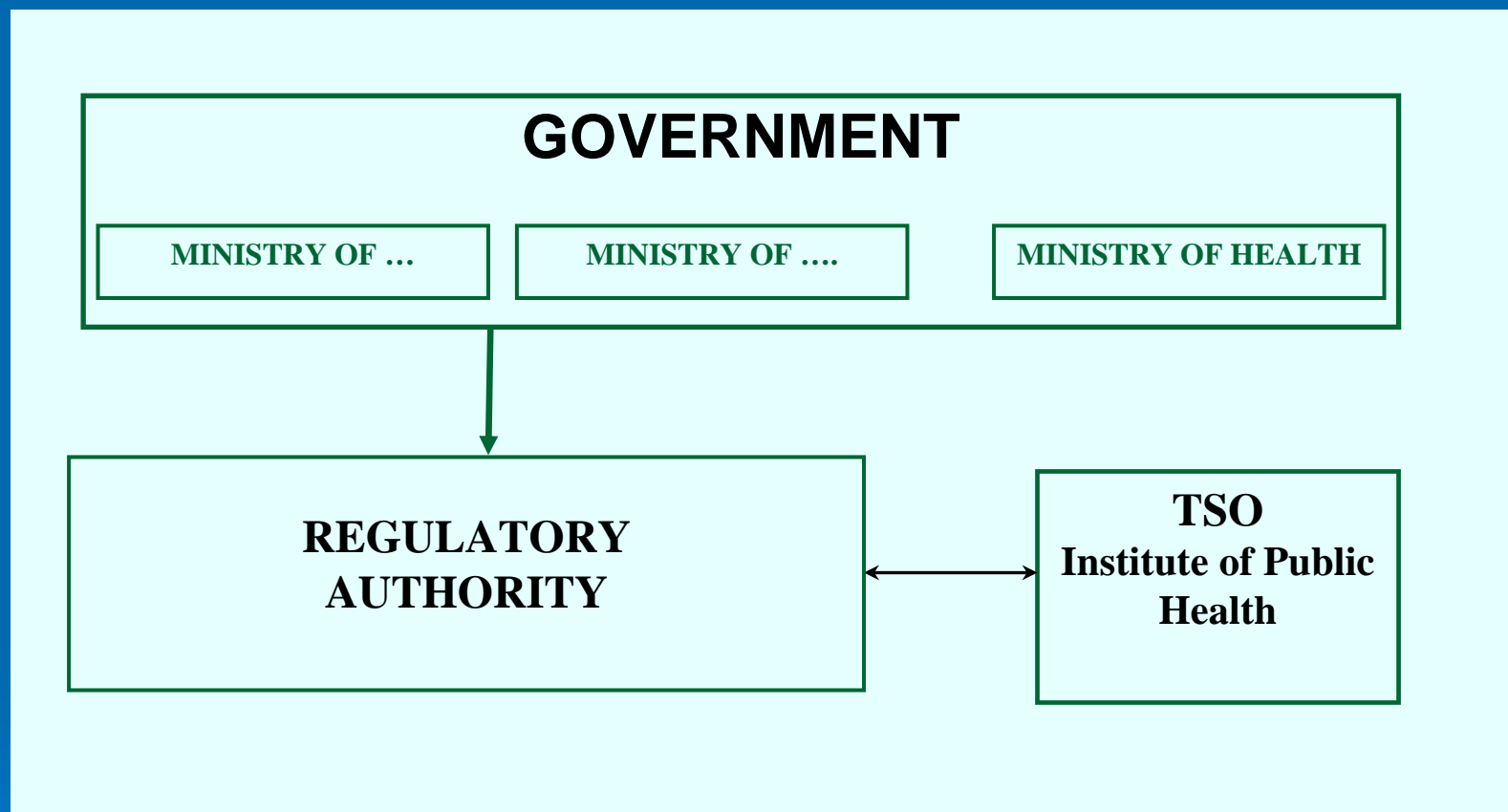
**Ionizing Radiation Laboratory**

**Skopje, Republic of Macedonia**

# Background

- no NPP or research reactors,
- limited number of applications mainly in medicine and industry,
- less than 1600 clasified radiation workers,
- limited number of qualified professional resources

# Radiation Safety Infrastructure



## Institute for Public Health (IPH)

The activities for radiation protection services are fulfilled through three departments within the Institute of Public Health:

- Ionizing Radiation Lab.,
- Radioecology Lab. and
- Labour medicine department.

# IPH - Laboratory for Ionizing Radiation

- Personnel Dosimetry Service
- IAEA/WHO Secondary Standard Dosimetry Laboratory
- Monitoring of Workplaces
- Mobile Team Services for Source Searches
- Advisory Services

# IPH - Laboratory for Ionizing Radiation

## Personnel Dosimetry Service

### Monitoring is:

**obligatory** for category A workers (probably to exceed 3/10 of the dose limits),  
**recommended** for category B (not probably to exceed 3/10 of the dose limits).

The measurements are based on:

- IEC 1066
- IAEA RS-G-13, "Assessment of occupational exposure due to external sources of radiation."
- ICRP 75, "General principles for the radiation protection of workers."
- National regulations

### Quality assurance system

March 2009 - accreditation from National Accreditation Institute  
(ISO17025)

# IPH - Laboratory for Ionizing Radiation

## Personnel Dosimetry Service

### Dosemeters in use

TLD consisted of a:

- TLD card with two elements of LiF (Harshaw/Bicron TLD 100)
- plastic holder (type 8814) with ABS filter (1000 mg/cm<sup>2</sup>) and Mylar filter (17mg/cm<sup>2</sup>)

### Dosimetry system

Harshaw Model 6600+and Harshaw Model 4500

### Calibration

- calibration in reference radiation fields (SSDL – IPH)  
*The intervals of calibrations at SSDL - every two months*
- calibration of the detector elements using an internal 'calibration source' of a TLD reader (Sr-90).  
*The frequency of ECC determination is once per year*

# IPH - Laboratory for Ionizing Radiation

## Personnel Dosimetry Service

### Performance testing

- Every two months at SSDL irradiations of dosimeters at 661.6 keV from Cs-137 at 0 incident angle with distribution of doses over the range from 0.5 mSv to 10mSv.
- Participates once per year in laboratory comparison or in intercomparison.

### Reports of dose information

They are expressed in personal dose equivalent  $H_p(10)$  or  $H_p(0.07)$ .

### Registration level for

whole body dosimeters is 0.1 mSv and  
extremity dosimeters is 2 mSv.




# IPH - Laboratory for Ionizing Radiation

## Workplace Monitoring

Designed in order to get sufficient information for:

- Evaluation of radiological conditions in workplaces,
- Exposure assessment in controlled and supervised areas, and in human environment
- Review of the classification of controlled and supervised areas and assessment of potential exposures

Laboratory provides workplace monitoring services:

- at the commissioning stage and
  - regular (once per year) monitoring
  - designed monitoring program
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# IPH - Laboratory for Ionizing Radiation

## Workplace Monitoring

Workplace monitoring includes

- dose rate measurements as well as
- measurement of radioactivity on surfaces.

Operational quantities:

- ambient dose equivalent  $H^*(10)$  and
- Bq/cm<sup>2</sup> for surface contamination.

Instruments are calibrated once per year at SSDL and have valid calibration certificate.

Workplace monitoring results and findings are available to line management and RPO.



# **IPH - Laboratory for Ionizing Radiation**

IAEA/WHO Secondary Standard Dosimetry Laboratory

Maintains a secondary standard for Kair traceable to primary standard through IAEA/WHO network

## **Instruments & equipment**

LS01 (1000 cm<sup>3</sup>) and LS10 (10000 cm<sup>3</sup>) PTW ionization chambers

Thin window ionisation chambers Thermo NE2575 (600 cm<sup>3</sup>)

PTW UNIDOS electrometers

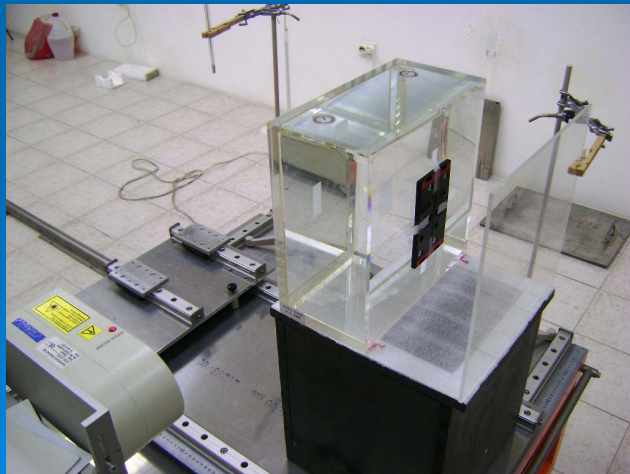
Cs-137 reference source (dose capability  $7,5 \cdot 10^{-6}$  -  $5,0 \cdot 10^{-2}$  Gy/h)

Sr-90/Y-90 source (stability check up)

X-ray Pantak max 225 keV (dose capability  $2,0 \cdot 10^{-4}$  -  $6,0 \cdot 10^{-2}$  Gy/h)

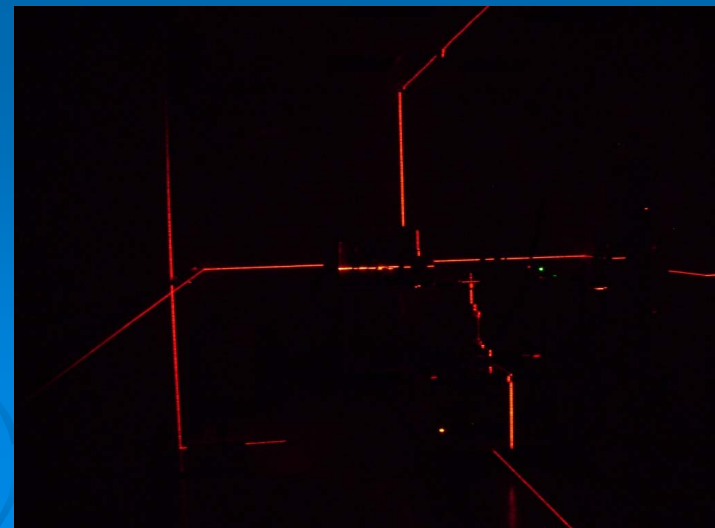
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IAEA/WHO Secondary Standard Dosimetry Laboratory



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# IPH - Laboratory for Ionizing Radiation

Mobile Team Services for Source Searches

Advisory services

A to all counterparts dealing with orphan sources within scrap metal and combating the illicit trafficking of radioactive and nuclear material.

The special task team is available 24 hours a day for radiation monitoring, consultancy, detection within the InBM

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# IPH - Laboratory for Ionizing Radiation

Mobile Team Services for Source Searches

Advisory services

If the radioactive orphan source is found in scrap metal shipment, the Lab:

performs radiation monitoring of the shipment in detail until the part or parts containing the radioactive substance have been located, taking due care to ensure that all persons involved are adequately protected from radiation during the measurements (their exposures are kept ALARA);

Identify the radioisotopes

check to determine if any radioactive substances have been dispersed in the local area and assess the likelihood of any other area being affected prior to the arrival of the shipment;

draw up a report describing the actions taken, the results of the survey and gives advice for the safe transport of recovered radioactive sources

